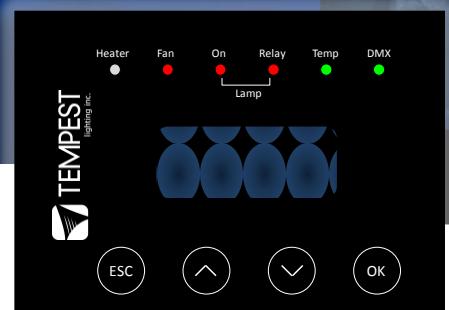




TEMPEST
lighting inc.

User Manual

Tornado Moving Light Enclosures



For the following products,
manufactured after August 2011

Tornado 2050
Tornado 2000
Tornado 2200
Tornado 2300
Tornado 2400

Tempest Lighting, Inc.
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With DEC3.2 version 0.01.001

In the interest of continuous product improvement, the information in this document is subject to change without notice. Neither Tempest Lighting, Inc. nor its representatives or agents may be held liable for expense or injury arising from it.

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Declaration of Conformity

This is to certify that the following products

Tornado 2000.IN(H,V) Lighting Enclosure
Tornado 2200.IN(H,V) Lighting Enclosure
Tornado 2300.IN(H,V) Lighting Enclosure

are in Compliance with the following standards or specifications according to the EMC Directive 89/336/EEC.

EN55015, EN61000-3-4, EN61000-3-5, EN61000-4-2, EN61000-4-3, EN61000-4-4, pr EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

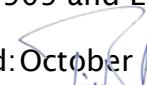
and are in compliance with the following standards or specifications according to the Low Voltage Directive 73/23/EEC.

EN60598-1

This declaration is made by the manufacturer

**Tempest Lighting, Inc.
5401 Bevis Avenue
Sherman Oaks, CA 91411, USA**

This declaration is based on tests that were conducted on the submitted samples of the above mentioned products. Detailed results can be referred to test reports CET.TE200909 and LVT.Te200909.

Dated: October 26th, 2009
Signature 
Tempest Lighting Inc





Declaration of Conformity

This is to certify that the following product:

Tornado 2400.IN Lighting Enclosure

is in Compliance with the following standards or specifications according to the EMC Directive 89/336/EEC.

EN55015, EN61000-3-4, EN61000-3-5, EN61000-4-2, EN61000-4-3, EN61000-4-4, pr EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

and are in compliance with the following standards or specifications according to the Low Voltage Directive 73/23/EEC.

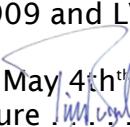
EN60598-1

This declaration is made by the manufacturer

**Tempest Lighting, Inc.
5401 Bevis Avenue
Sherman Oaks, CA 91411, USA**

This declaration is based on tests that were conducted on the submitted samples of the above mentioned products. Detailed results can be referred to test reports CET.TE200909 and LVT.Te200909.

Dated: May 4th, 2010

Signature .....

Tempest Lighting Inc





Declaration of Conformity

This is to certify that the following product:

Tornado 2050.IN Lighting Enclosure

is in Compliance with the following standards or specifications according to the EMC Directive 89/336/EEC.

EN55015, EN61000-3-4, EN61000-3-5, EN61000-4-2, EN61000-4-3, EN61000-4-4, pr EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11

and are in compliance with the following standards or specifications according to the Low Voltage Directive 73/23/EEC.

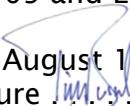
EN60598-1

This declaration is made by the manufacturer

**Tempest Lighting, Inc.
5401 Bevis Avenue
Sherman Oaks, CA 91411, USA**

This declaration is based on tests that were conducted on the submitted samples of the above mentioned products. Detailed results can be referred to test reports CET.TE200909 and LVT.Te200909.

Dated: August 16th, 2010

Signature .....

Tempest Lighting Inc





This is to certify that the following products

Tornado 2000.US(H,V) Lighting Enclosure
Tornado 2050.US Lighting Enclosure
Tornado 2000.US(H,V) Lighting Enclosure
Tornado 2200.US(H,V) Lighting Enclosure
Tornado 2300.US(H,V) Lighting Enclosure
Tornado 2400.US Lighting Enclosure

Have been tested and approved to standards UL 508 (electrical) and UL 50 (environmental), as NEMA 3R enclosures, for use in the United States and Canada.

This declaration is made by the manufacturer

Tempest Lighting, Inc.
13110 Saticoy Street, Unit C
North Hollywood, CA 91605, USA

This declaration is based on tests that were conducted on the submitted samples of the above mentioned products.

Listing Report No. 3198609LAX-001a refers.

Dated: December 12th, 2010
Signature 
Tempest Lighting Inc

Tempest Lighting, Inc.,
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1 Introduction

Using This Manual

Please read this manual in its entirety before starting work. All the information contained is important, and should be read carefully before proceeding. Heed all warnings and advisories.

Terminology:

Enclosure - Tornado Lighting Enclosure

Luminaire - intelligent lighting fixture that will be placed into the enclosure

DMX - ANSI E1.11-2008, Entertainment Technology - USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories.

RDM - ANSI E1.20-2006, Entertainment Technology - RDM, Remote Device Management over DMX512 Networks

Icon Key:

① Valuable information

✗ Electrical Warning

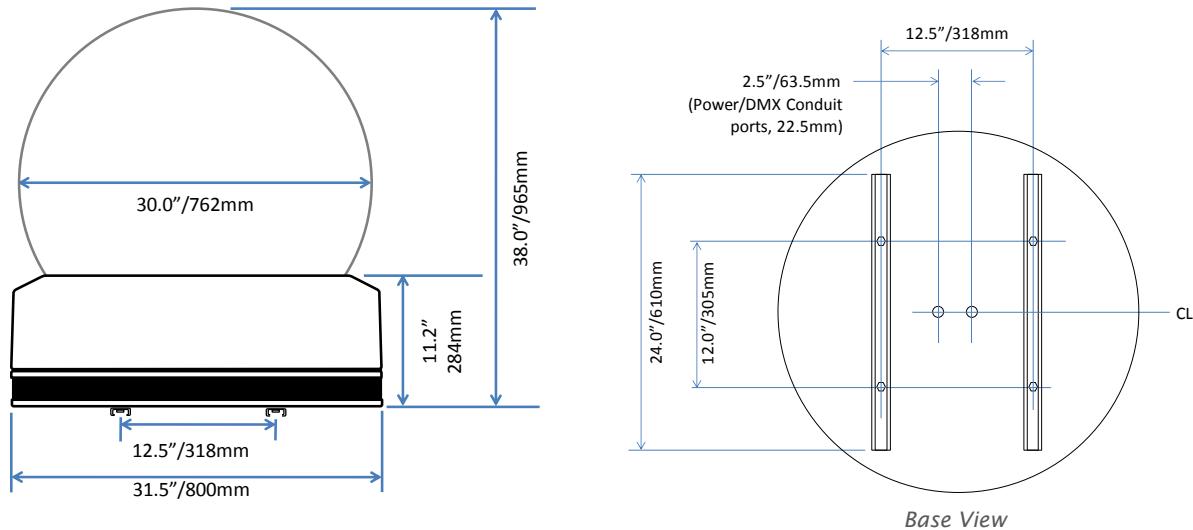
⚠ Safety Information

IMPORTANT SAFETY NOTICE: All safety instructions provided by the luminaire manufacturer must be followed carefully. Failure to do this may void both the luminaire and the enclosure warranties.

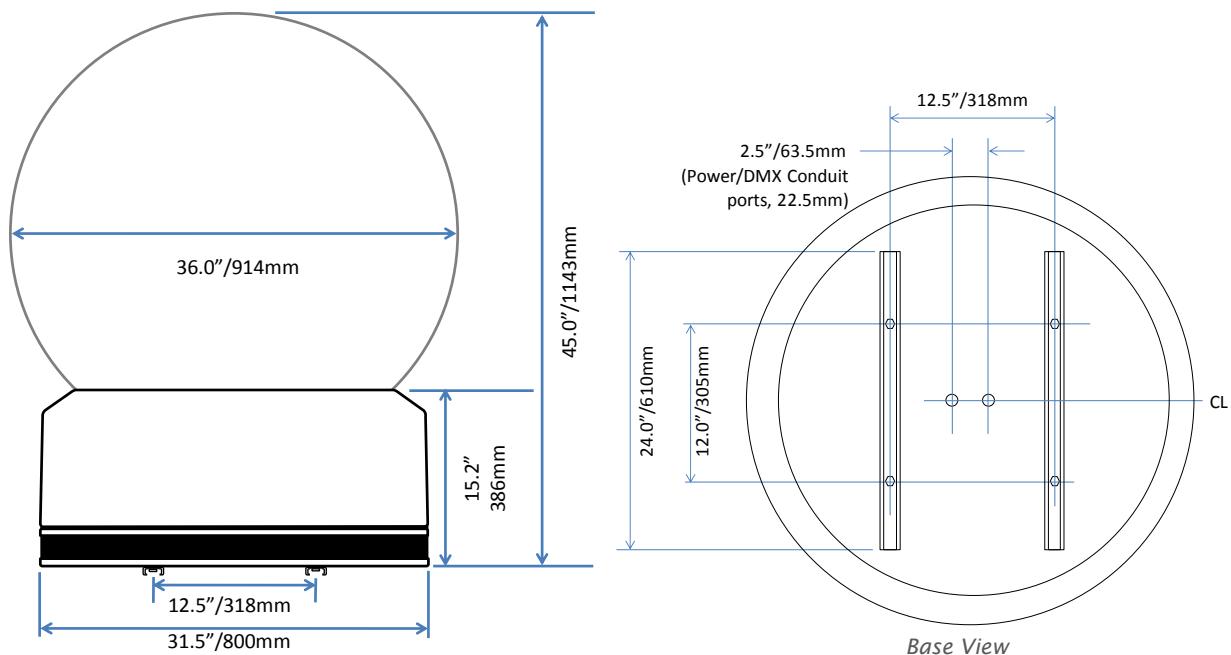
When working at heights or in awkward locations, it is imperative to develop a safety plan, based on the information in this manual, and on local conditions and safety regulations. The safety plan must be approved by the site engineer/safety officer, as appropriate to local conditions. NEVER attempt to install Tornado enclosures in high winds or when precipitation is present or imminent.

Dimensions

Tornado 2000 (Base Down)

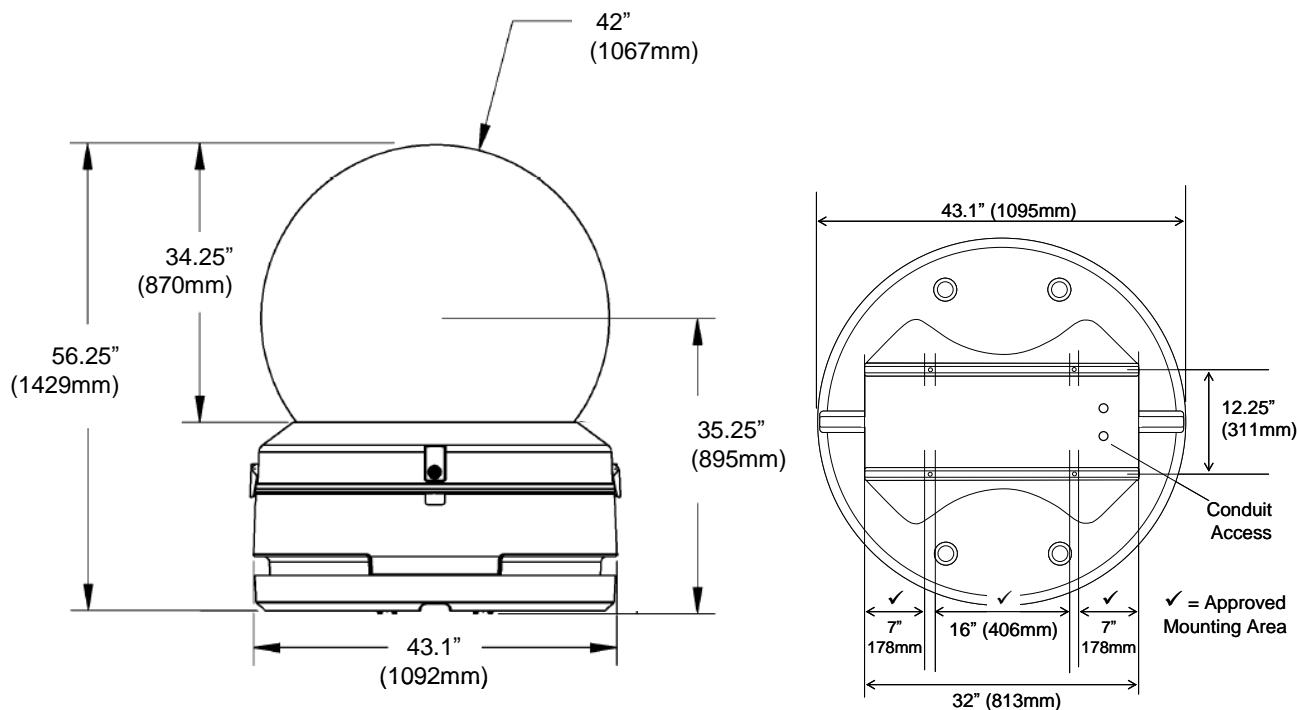


Tornado 2200, 2300 (Base Down)

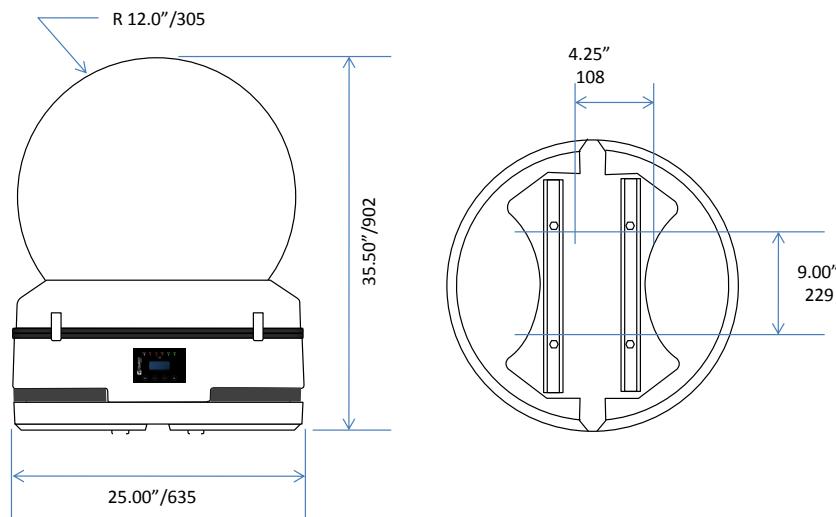


IMPORTANT: see additional dimensions for Base-up and Horizontal configurations on page 13

Tornado 2400 (Base Up or Down)

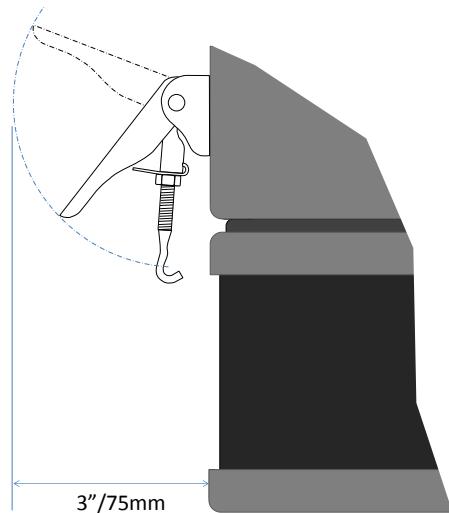


Tornado 2050 (Base Up, Down or Horizontal)



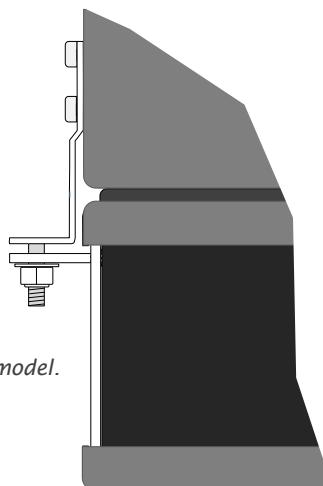
Note – Draw Latch Clearance

Allow adequate clearance for all latches.



Note – Marine Latches

Marine Latches require a tool to open the enclosure.



*Marine Latch.
Designs vary slightly by model.*

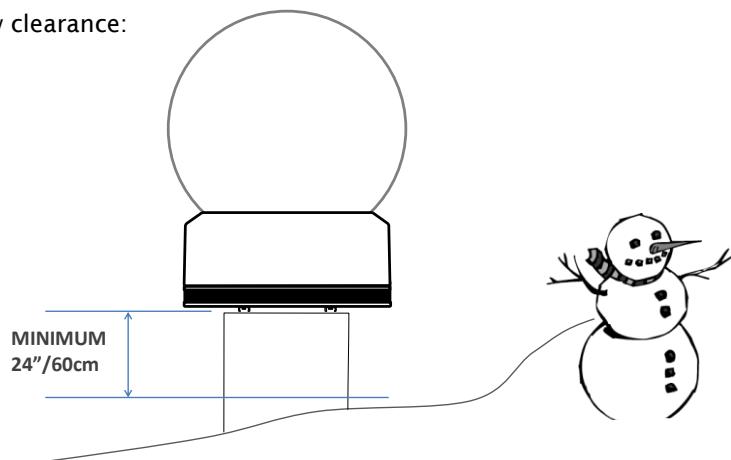
2 Installation

Safety and Warnings

- Read the Manual before installing the enclosure
- Read the manual before opening or servicing the enclosure
- Never leave the enclosure unattended when open.
- Ensure all bolts and terminals are tight and clean
- Do not touch the heater unless you can be sure that it is cool.
- Observe all warning labels in the enclosure itself.
- ✗ Do not open any electrical boxes until power is off
- ✗ Do not open the enclosure in wet weather.
- ⓘ Never move the enclosure with the luminaire inside.
- ⓘ Never handle the enclosure by the globe.
- ⓘ Always lift from under the base.

Planning

- ① Snow clearance:

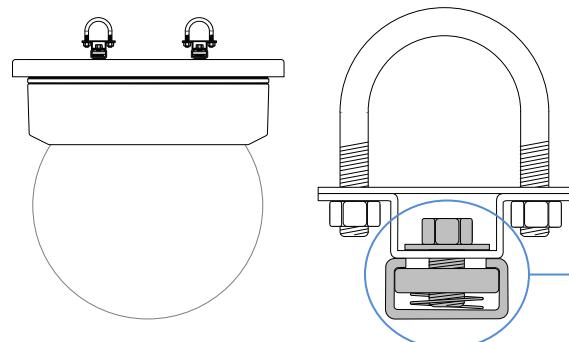


- ① Enclosure must be powered 24/7/365.
- ⚠️ **Warning:** This installation cannot be safely completed by 1 person.

Mounting

- ① **Each Enclosure must be mounted with FOUR points.**
- ① Tempest Lighting recommends only stainless steel mounting hardware.
- ① The bolts attaching the enclosure to its shipping pallet are mounting bolts. **Do not Discard.**
- ① All mountings must be made using the two Unistrut channels on the base of the enclosure.

Pipe Mounting



Pipe Clamps

4900.MCT Pipe clamp, for pipes 1.5" (38mm) to 2" (50mm) OD. Order four per enclosure.

4925.MCT Pipe clamp, for pipes 2" (50mm) to 2.5"/64mm OD. Order four per enclosure.

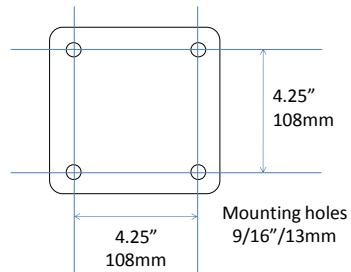
Note: These parts are supplied with the Tornado enclosure.

Mounting plate Guidelines

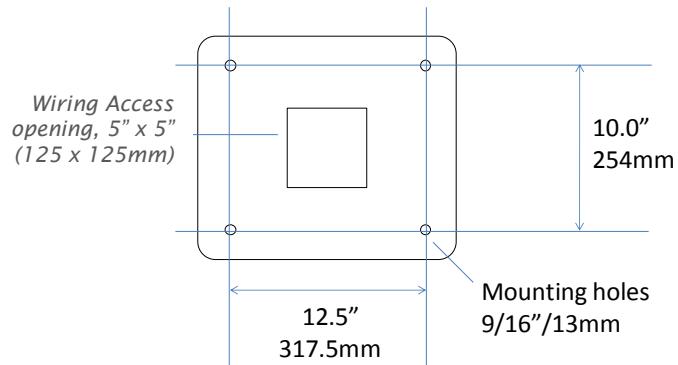
Use $\frac{1}{4}$ " (6mm) or greater aluminum or stainless steel plate.

Do not obstruct wiring access.

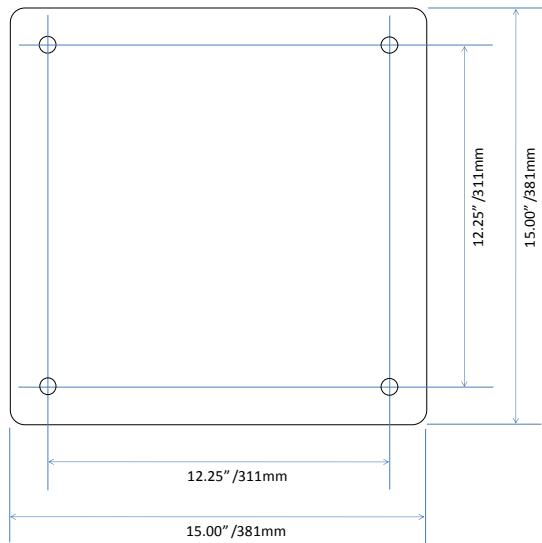
Tornado 2050 Mounting Hole Pattern



Tornado 2000, 2200, 2300 Mounting Hole Pattern

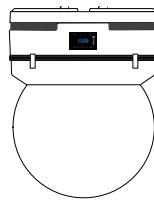
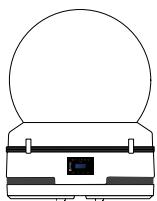


Tornado 2400 Mounting Hole Pattern

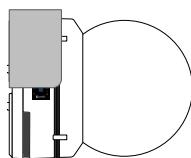


Orientation

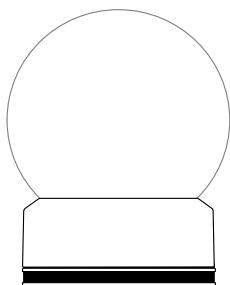
Tornado 2050.xx



Tornado 2050.xxH



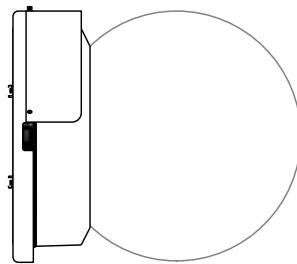
Tornado 2060.xxH



Tornado 2000.xx

Tornado 2200.xx

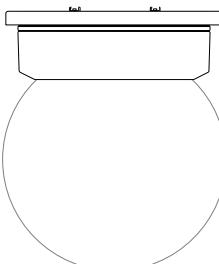
Tornado 2300.xx



Tornado 2000.xxH

Tornado 2200.xxH

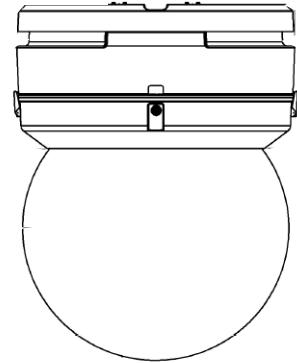
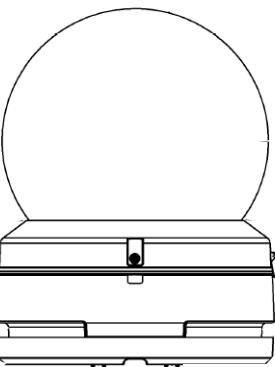
Tornado 2300.xxH



Tornado 2000.xxV

Tornado 2200.xxV

Tornado 2300.xxV

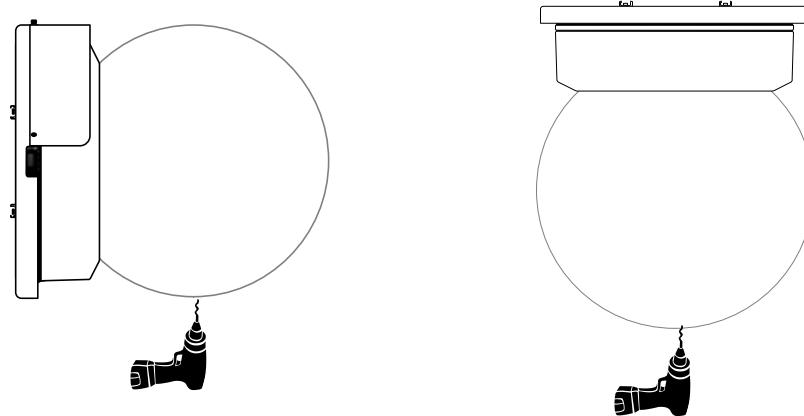


Tornado 2400.xx

Drainage

For base up/globe down or horizontal operation, a small drainage hole will be drilled in the globe, to permit any water draining through the enclosure to exit harmlessly.

This will normally be done at the factory, but if done on site, **YOU MUST USE THE APPROPRIATE TAPERED DRILL BIT, OBTAINABLE FREE OF CHARGE FROM TEMPEST LIGHTING. A standard drill bit may crack the plexiglass globe. Tempest Lighting will not be responsible for such damage.**



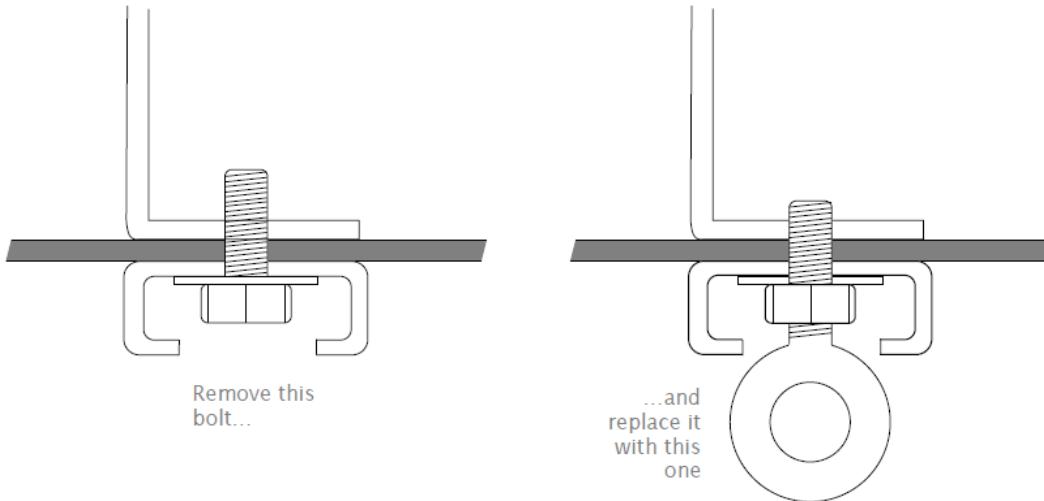
Horizontal Enclosures - be sure to replace the globe with the drainage hole at the lowest point after relamping.

Installation above public Spaces

If the Tornado enclosure is to be installed above an area accessible to the public (eg a street or an auditorium), some jurisdictions require a safety bond to be installed.

A stainless steel eyebolt is included with base-up and horizontal versions, and should be installed as follows:

1. Remove one of the four bolts holding the Unistrut onto the enclosure base
2. Replace it with the eye bolt, washer and nut supplied, and screw down tight



Safety Bond

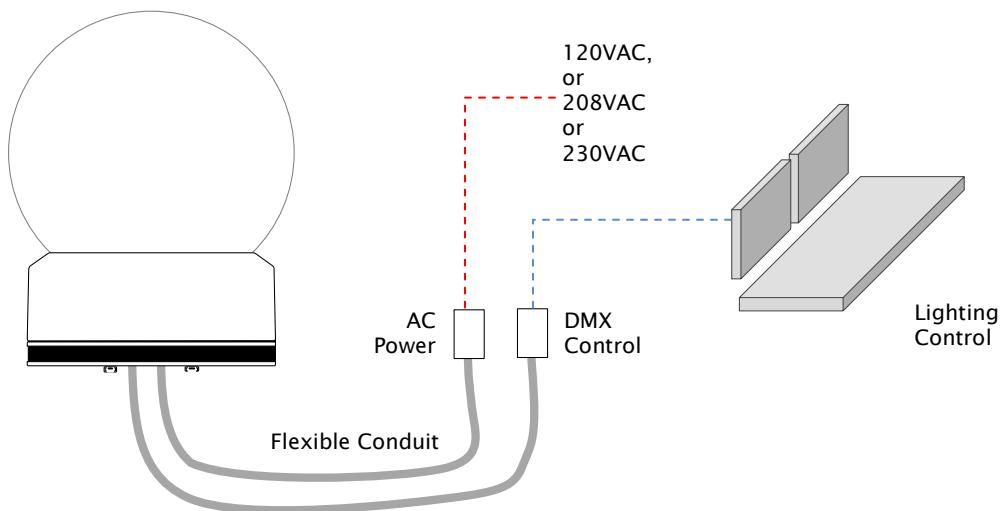
Use a suitably-rated steel wire rope, threaded through the eyebolt, and attach securely to a structural member, in accordance with local safety regulations.



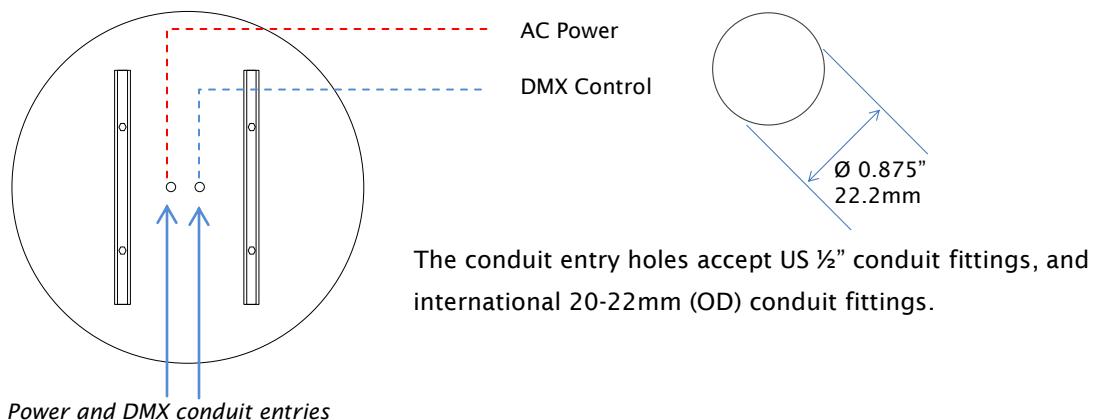
3 Wiring and Control

- ↗ All electrical work must be carried out by a properly licensed electrician, in compliance with local electrical standards. Failure to observe this point will void the factory warranty for the Tempest Enclosure.

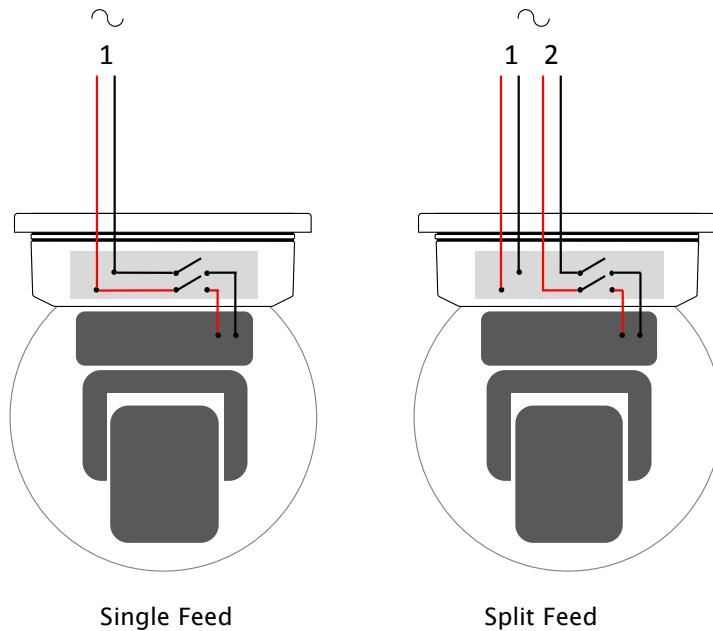
- 1 Switch off power to the branch circuit, carefully following lockout and tag-out procedures. Failure to do so could cause serious injury or death.
- 2 You will need two electrical junction boxes, located within a short distance from the enclosure, one for power, one for DMX control. Use outdoor-rated flexible conduit between the box and the enclosure.
- 3 AC and control circuits must be wired in separate conduits.



Conduit entry holes



One or Two Power Circuits?



Tempest enclosures may be wired on single or double line supplies. On a single feed, both enclosure and luminaire are permanently on. With a double-line supply, you can switch off the luminaire when not in use, while the enclosure continues to protect it 24/7.

Single Feed

Enclosure and luminaire are permanently on.

Enclosure and Luminaire must be rated for the same voltage.

Supply must be rated for luminaire current plus 150 watts.

Supply must be permanently ON.

Split feed

Enclosure power must be permanently ON.

Luminaire power may be switched off.

Enclosure power must be rated for 1150 watts.

Luminaire power must be rated for the luminaire (see luminaire manual).

Luminaire and enclosure power must be same voltage.

Either way, the enclosure must be powered 24/7, in order to protect the luminaire inside against condensation and extremes of temperature.

Since the enclosure heater(s) never operate when the projector/fixtures lamp is on, it is NOT necessary to rate the power service for the SUM of the enclosure and the projector/light fixture.

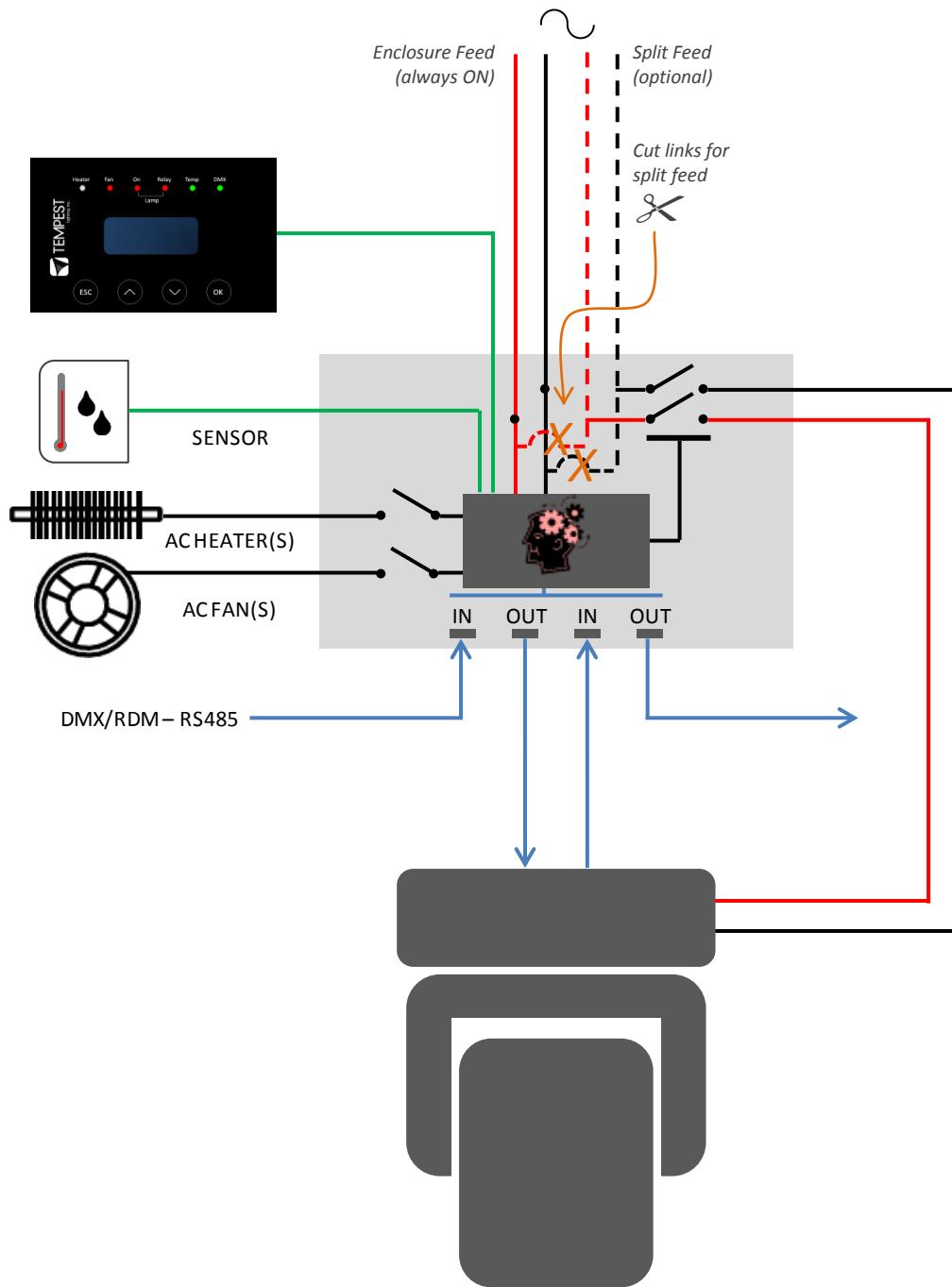
4 Digital Enclosure Control – DEC3.2™



DEC3.2™ – that's *Digital Enclosure Control, third Generation, revision 2* – is the brain of your Tempest enclosure. It will maintain the internal environment in a comfortable temperature and humidity range, and prevent condensation – the real killer of outdoor equipment. DEC3.2 monitors internal temperature, humidity and lamp current at all times, and uses this information to control the enclosure's lamp relay, fan(s) and heater(s). It can report back over the DMX cable, using the RDM protocol (Remote Device Management) if desired.

Unless otherwise specified, this version of the user guide refers to DEC3.2 units fitted with software version 0.1.xxx or later.

DEC3.2 Schematic



DEC3.2 Main Functions

- 1 Sense current to luminaire (lamp on/off)
- 2 Record lamp hours
- 3 Monitor temperature and humidity inside Enclosure
- 4 Maintain temperature at safe operating level
- 5 Prevent condensation
- 6 Isolate luminaire in case of unsafe temperature
- 7 Report status over RDM
- 8 (Optional) remote luminaire relay control over DMX

DEC3.2's function depends on whether the luminaire lamp is on or off:

Lamp ON

- Fans on
- Heater off
- Monitor temperature and humidity
- Isolate luminaire power if temperature exceeds max limit
- Record lamp hours

Lamp OFF

- Monitor temperature and humidity
 - If temp below bottom setting, run heater
 - If temp above top setting, run fans
 - If temp in normal range, run anti-condensation routine

Factory Settings – Basic Mode

In most applications, DEC3.2 will operate correctly with its factory default settings, in Basic operating mode.

You do not need to do anything. Please skip to the **Power Connections** section below.

If your needs are more complex, read on.

Operating Modes

DEC3.2 may operate in one of four modes, set using either the Front Panel or by RDM control. In all configurations, the luminaire inside the enclosure may also be an RDM enabled device.

Basic Mode (factory setting)

- Standard temperature settings
- DMX and RDM disabled
- Best for standalone operation

Monitor Mode

- As Basic mode, plus:
- RDM status reporting
- RDM configuration – settings may be changed remotely or at the enclosure control panel
- DEC3.2 does not require a DMX signal to operate

Control Mode

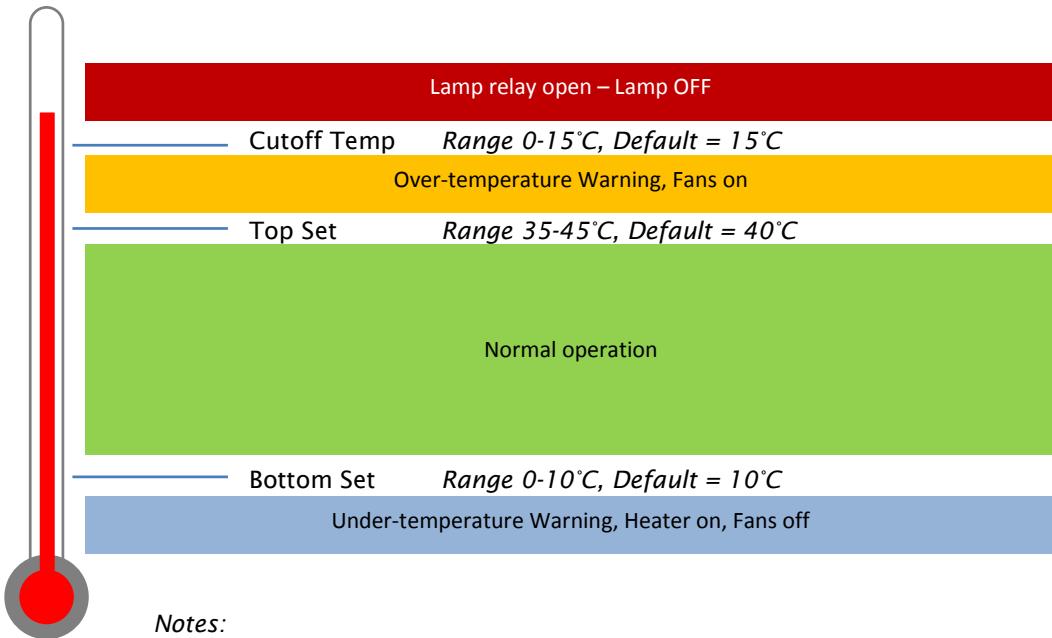
- As Basic mode, plus:
- Enclosure functions as a 1-channel DMX device, with remote control of the lamp relay
 - DMX level > 75% enables normal relay operation (normally ON)
 - DMX level < 25% disables normal relay operation (relay turns OFF)
 - This allows you to force a hard reset of the lamp relay in the event of a luminaire malfunction
- Control mode is recommended for show control applications, but can be risky in live show operation.

Service Mode

- For trained service personnel only
- Normal operation is suspended and the enclosure functions as a 3-channel DMX device:
 - Lamp Relay
 - Fans
 - Heater
- Service mode is ONLY for troubleshooting – DO NOT use Service mode for normal operation.

DEC3.2 Control Parameters

Temperature Settings:



Notes:

- 1 *The Cutoff Temperature is an incremental temperature range above the Top Set temperature. So the default 15°C cutoff and 40°C Top Set means that the lamp relay will open when a temperature of 55°C is reached.*
- 2 *In moving light enclosures the temperature sensor is located in the exhaust airflow. Temperatures shown may be higher than those around the luminaire.*
- 3 *We recommend using the factory default settings for several weeks or months before making any changes. In most cases they will not be necessary.*

Humidity	Range 50-90%, Default 80%
	The threshold at which incoming air is more aggressively heated to remove moisture.
DMX Address	Range 001-510, Default 001
	Sets the DMX address for the lamp relay control.
Fan Overrun	Range 1-15 minutes, Default 5 minutes
	Time that the enclosure fan(s) will run after the fixture/projector lamp is turned off.
Temp C/F	Display Degrees Celsius or Fahrenheit. Default Celsius
	Note that temperature settings must always be Celsius.
Lamp Hours	Default 0000
	Counts lamp hours – you must reset to zero when changing lamps.

DMX Connections

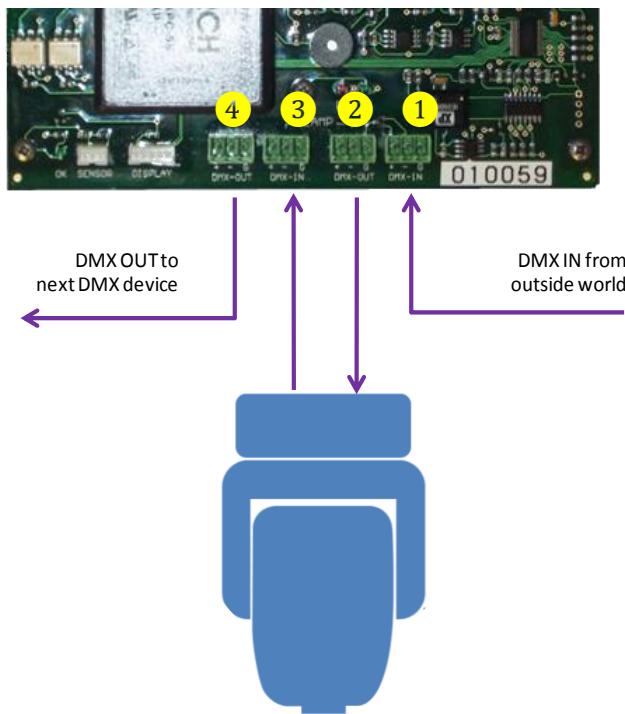
DMX refers to USITT DMX512, a commonly used control protocol in the entertainment industry, running over RS485. Consult USITT DMX installation guidelines when laying out a system, or employ a qualified DMX system integrator.

A DMX network will be required if:

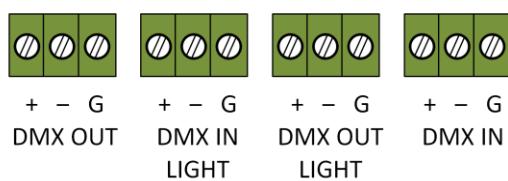
- a) The fixture inside the enclosure requires a DMX control signal
- b) You wish to monitor the enclosure using RDM
- c) You wish to control the enclosure lamp relay over DMX

DMX Terminations

Pinout: (1) Ground, (2) Data -, (3) Data +.



DMX terminal Pinout Detail



DMX Connectors:

- 1 DMX IN from network
- 2 DMX OUT to luminaire (or to network if not controlling luminaire)
- 3 DMX IN from luminaire
- 4 DMX OUT to network

If the enclosed fixture does not use DMX, then connector (2) on the controller is DMX OUT for the enclosure.

DMX Line Terminations

DMX cable runs must be terminated at the far end of the cable run with a termination resistor as detailed in the DMX512 standard.

The individual fixtures installed inside the Tempest enclosures must NOT be terminated. It is recommended that any line termination is done using the 3-pin terminal connector fitted to the DEC3.2 control circuit board.

Remote Device Management (RDM)

RDM refers to ANSI E1.20, a control protocol in the entertainment industry used for device configuration and monitoring, and essentially an “extension” of DMX512. The use of RDM is optional, and uses *the same RS485 cable connection* as DMX512, so **no additional wiring** is required. The user must ensure that any DMX splitters or other routing devices used are rated for RDM as well as DMX use. Tempest strongly recommends working with a qualified RDM system integrator when designing an RDM network. Go to www.tempestlighting.com for contact information.

RDM and RDM Integration

DEC3.2’s RDM implementation allows system integrators to set up remote control and status monitoring of all attributes and sensors, including:

- Relative Humidity
- Air Temperature
- PCB Temperature
- Lamp Current
- Elapsed Lamp Hours
- Lamp Relay Status
- Fan Relay Status
- Heater Relay Status
- DMX Status
- DMX Start Address
- DMX Personality (RDM Mode)
- Device Type
- Device Label
- Software Version



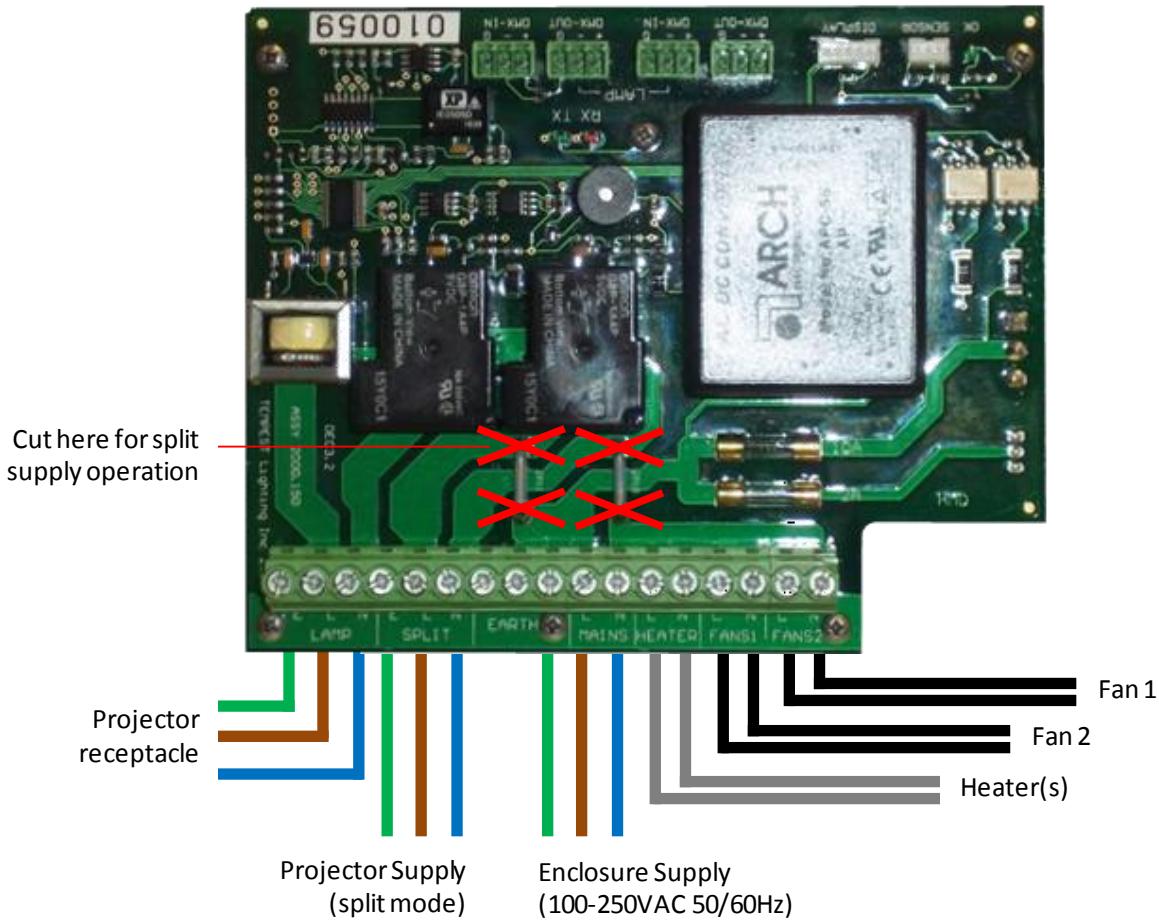
RDM is an effective and powerful tool for commissioning and monitoring an installation, particularly in large systems. For further guidance, please consult a qualified RDM system integrator. Tempest Lighting warrants

DEC3.2 to be compliant with the RDM standard, but is not an RDM systems integrator, and can offer only basic guidance on RDM utilization.

Power Connections

IMPORTANT Tempest enclosures are supplied for either 120VAC 50/60Hz, or 208-240VAC, 50/60Hz operation. Tempest Lighting is not liable for damage or failure to operate correctly due to connection to an inappropriate electrical supply.

ALL ELECTRICAL CONNECTIONS MUST BE UNDERTAKEN BY A QUALIFIED ELECTRICIAN, IN COMPLIANCE WITH LOCAL NORMS AND STANDARDS.



Note: wire colors may differ depending on applicable electrical standards. European wire colors are shown here.

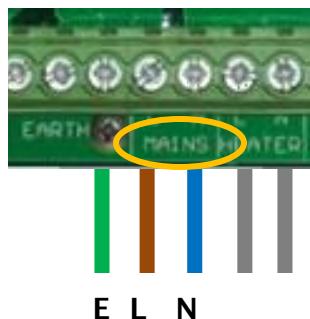
IMPORTANT: MAKE SURE THAT TERMINAL SCREWS ARE FULLY BACKED OUT BEFORE INSERTING WIRES.

Common Feed operation (factory default)

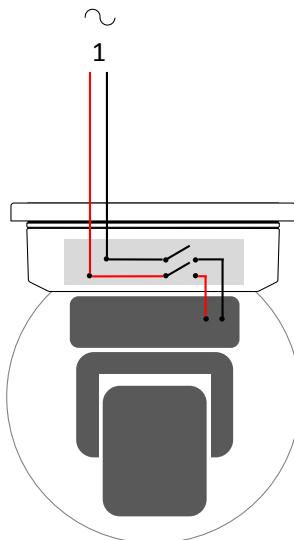
Enclosure and luminaire share the same electrical circuit.

Circuit must be powered ON 24/7.

Connect incoming power to the terminals labeled **MAINS**:



- (E) Earth/Ground
- (L) Live
- (N) Neutral

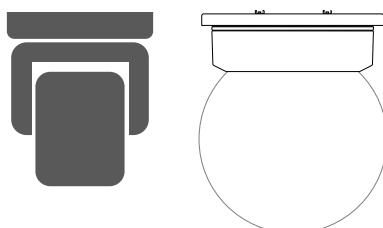
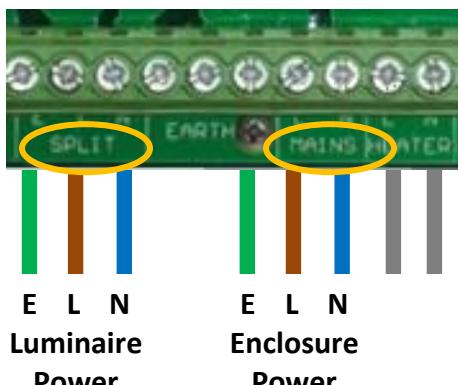
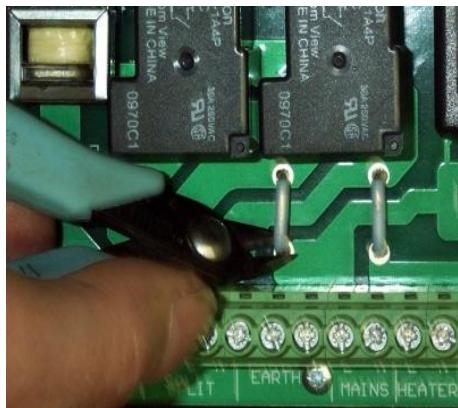


Split Feed Operation

Enclosure and luminaire have separate electrical feeds.

The enclosure circuit must be powered ON 24/7.

When splitting the feeders, both circuits should be on the same phase and at the same supply voltage.

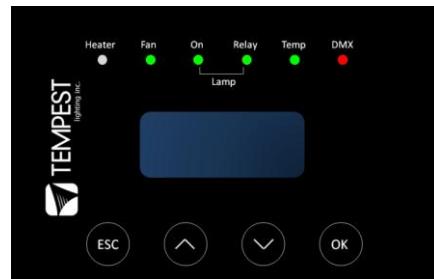


- 1 Use a wire cutter to cut the copper links on the DEC3.2 board in four places.
- 2 Connect incoming **ENCLOSURE** power to the terminals labeled **MAINS**. This supply **MUST** be maintained 24/7.

(E) Earth/Ground (L) Live (N) Neutral
- 3 Connect incoming **LUMINAIRE** power to the terminals labeled **SPLIT**:

(E) Earth/Ground (L) Live (N) Neutral

Control Interface



LED Indicators

Heater	SHORT PULSES	Lamp is off
	(green)	Temperature is normal
		Heater is pulsing to prevent condensation
	ON (Green)	Temperature is LOW
		Heater is ON
	OFF	Lamp is on
		Temperature is normal
Fan	PULSES	Lamp is off
	(green)	Temperature is normal
		Fan is moving small amount of air to prevent condensation
	ON (Green)	Lamp is ON, or
		Temperature is HIGH
		Fan is cooling enclosure
Lamp On	ON (Green)	Current sensing shows lamp is ON
		Lamp hour counter is running
	OFF	Current sensing shows lamp is OFF
		Lamp hour counter is not running
Lamp Relay	ON (Green)	Lamp relay is closed (normal)
		Luminaire power receptacle is energized
	OFF	Lamp relay open (due to overtemp or DMX control). Luminaire is electrically isolated
Temp	ON (Green)	Temperature is in normal range
		
	ON (Red)	Temperature is above Top setting, or below bottom setting
		
	FLASHING (Red)	Temperature is above Cutoff level
		Luminaire power is isolated
DMX	OFF	DEC3.2 is in BASIC Mode - DMX not used
	ON (GREEN)	Good DMX or RDM data packet received.
		
	ON (RED)	Control Mode: DMX Fail
		Monitor Mode: No RDM information being received (this is normal)

Control Interface Operation

The Control Interface is normally LOCKED.

To UNLOCK, hold **ESC** and **OK** together for 5 seconds.

You are now in the **CONTROL MENU**

Use **↑ ↓** to scroll up and down the menu.

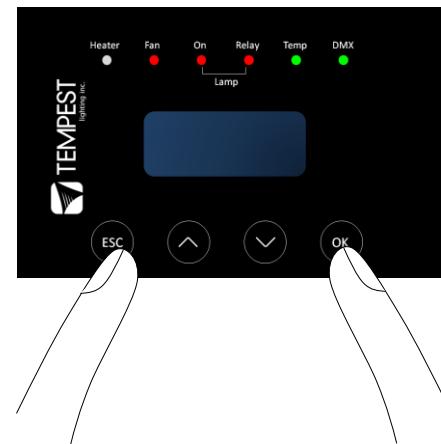
Press **OK** to enter a menu item

Use **↑ ↓** to set the item parameter, or to scroll to the next menu level.

Use **ESC** to go BACK, and **OK** to confirm settings (**↔**).

To LOCK, hold **ESC** for 5 seconds.

Menu will time out after ten minutes.



The Control Menu

SET DMX OPTIONS

SET DMX MODE

This menu item allows the user to check (and if necessary change) the DMX/RDM mode.

BASIC	Standalone operation, no DMX/RDM (factory default)
MONITOR	Standalone, plus support for RDM remote configuration and monitoring
CONTROL	Monitor, plus use of a single DMX address to control Lamp relay
SERVICE	Monitor, plus use of three DMX slots to control Lamp, heater and fan

Important: Please ensure that the DEC3.2 is NOT left in Service Mode.

SET DMX ADDRESS (in Monitor, DMX or Service modes)

Select a DMX starting address in the range 001 to 510

1 - Lamp Relay

In Service Mode an addition two slots are available

2 - Fan Relay

3 - Heater Relay

Note that the DMX control is designed using a SAFETY pile-on Logic. So the DMX input can only override automatic settings in a safe manner.

SET DMX CURVE

DMX Curves affect the way the fixture relay is controlled in Control Mode.

DMX levels are shown as %.

Response Curve 1 (default)

DMX level 0-25	Relay disabled (open)
DMX level 26-75	<i>No change to relay status</i>
DMX level 76-100	Relay enabled (normally closed)

Response Curve 2

DMX level 0-19	<i>No change to relay status</i>
DMX level 20-40	Relay disabled (open)
DMX level 41-59	<i>No change to relay status</i>
DMX level 60-80	Relay enabled (normally closed)
DMX level 81-100	<i>No change to relay status</i>

SET DMX RESPONSE

DMX Response sets a delay time before DMX Control Mode settings are acted on.

Setting a response delay of a few seconds would prevent unintended fixture relay state changes in the event of a short accidental change in DMX level.

NOTE: from firmware revision 0.00.100, DEC holds last valid DMX level if DMX is interrupted.

Response Delay Values are:

No Delay (default), 1, 2, 5, 10, 15, 20, 30, 60 seconds.

SET TEMP UNITS

Choose to display temperature values in Celsius or Fahrenheit (default Celsius)

Note that temperature settings must be entered in Celsius.

SET TEMP RANGES

Set three temperature trigger points for Bottom, Top and Cutoff temperatures, in °C.

TEMP BOTTOM

(default 10°C, permissible range 0-10°C).

TEMP TOP

(default 40°C, permissible range 35-45°C).

TEMP CUTOFF

(default 15°C, permissible range 0-15°C).

SET FAN OVERRUN

Fan will keep running after luminaire lamp is sensed to change from ON to OFF, to allow the lamp to cool safely.

Default is 5 minutes, permissible range 0-15 minutes.

SET LAMP ON POINT

Set the threshold at which the enclosure determines that the lamp is on. Range between 0.1 amp - 2.0 amps, in 0.1 amp steps. Default is 1.0amp.

RESET LAMP HOURS

Reset each time you change the lamp in the fixture/projector.

Hold [OK] until you hear the beep.

Make this a part of your relamping routine.

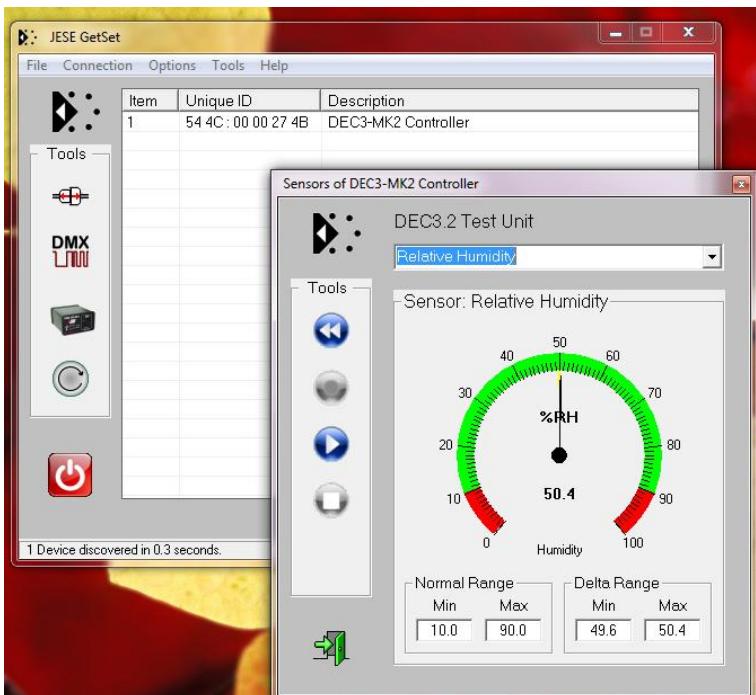
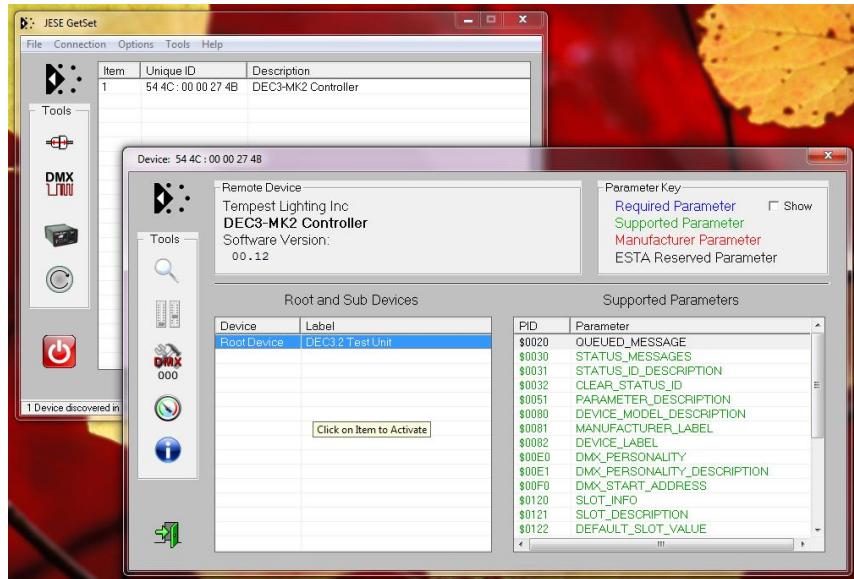
STATUS DISPLAY

View current status information, using the arrow keys to scroll through:

- a) Humidity - relative humidity in %
- b) Air temperature, in degrees C or F
- c) PCB temperature
- d) Current being drawn by projector/light fixture, in amps
- e) Lamp Hours elapsed
- f) Firmware version

RDM Monitoring and Configuration

All the features accessible over the DEC3.2 control panel are also available over RDM. Just how this information is displayed will depend on the RDM interface used. These screen shots were taken running the GetSet program in Windows 7, and connecting to a DEC3.2 controller using a RDM TRI MK1 interface, both from JESE Ltd (www.jese.co.uk).



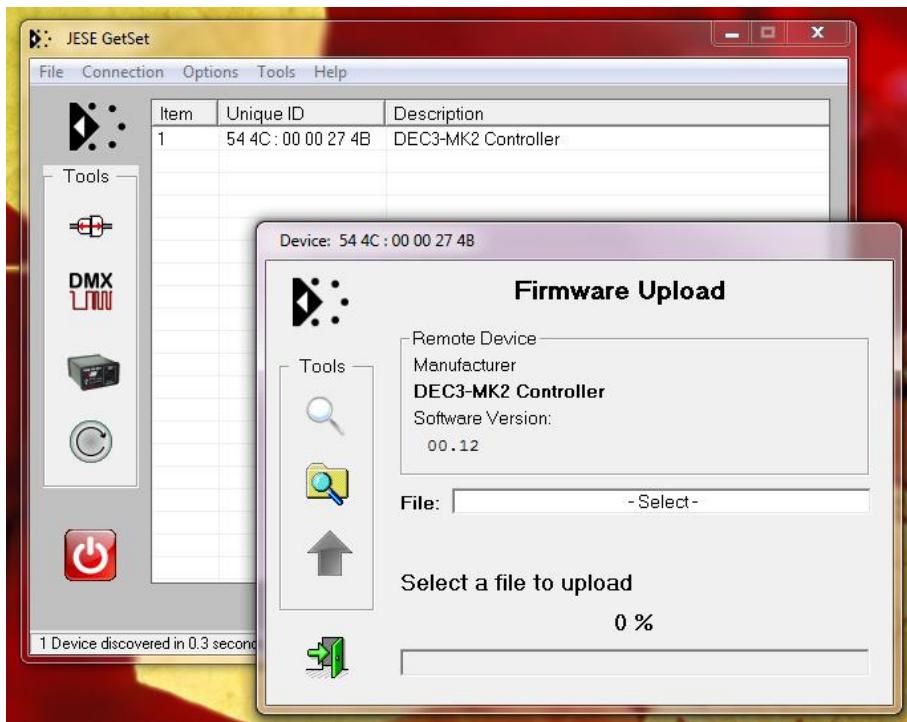
This view shows a single DEC3.2 test unit that has been correctly discovered and labeled by the GetSet software suite, and a log of RDM messages.

This RDM interface provides a graphic view of the various sensor functions supported by DEC3.2

Important:

Check that your RDM interface vendor has tested his interface with Tempest enclosures and all other RDM devices you plan to use on the same network.

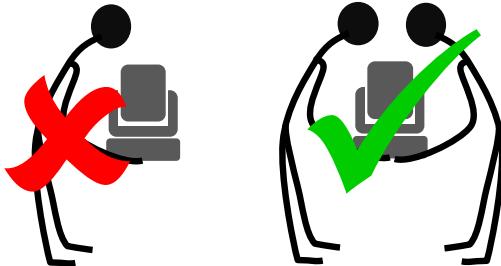
Firmware Upgrade over RDM



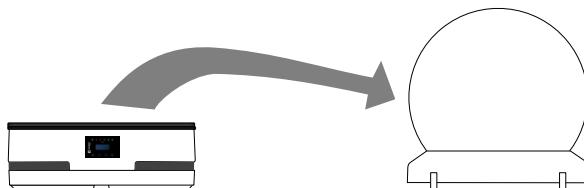
DEC3.2 firmware is field-upgradeable, using RDM. A field upgrade requires a JESE RDM TRI MK1 interface to be connected to the DMX network on which the DEC3.2 is located, and the use of JESE GetSet software.

5 Mounting the Luminaire

- ⚠ Do not attempt to mount the luminaire with only a single person.



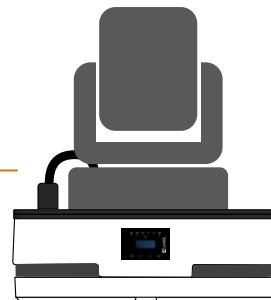
- 1 Remove the globe and place it in a safe location.



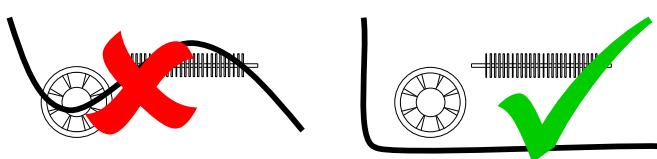
- 2 Follow the instructions below for different luminaire types



- 3 Plug the luminaire into the power receptacle in the enclosure, and then connect the DMX cables to the luminaire

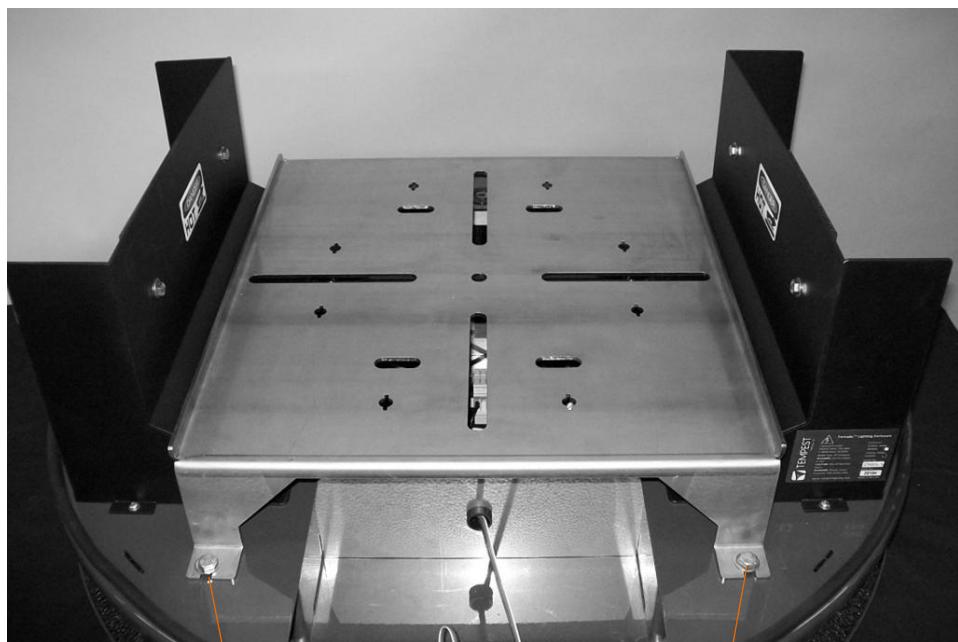
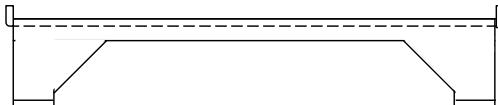
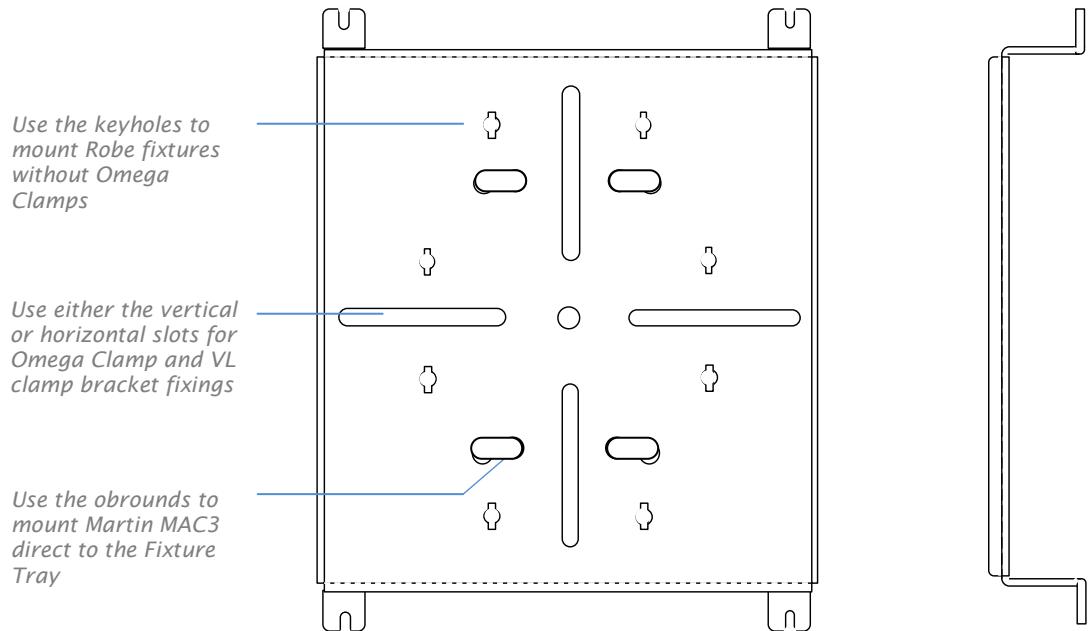


- 4 Tie down cables (to the luminaire or enclosure base) so that they will not come into contact with the heater or fans at any point.



Tornado 2000, 2200, 2300

Fixture Tray



Remove the Fixture
Tray by removing the
four 5/16" mounting
bolts

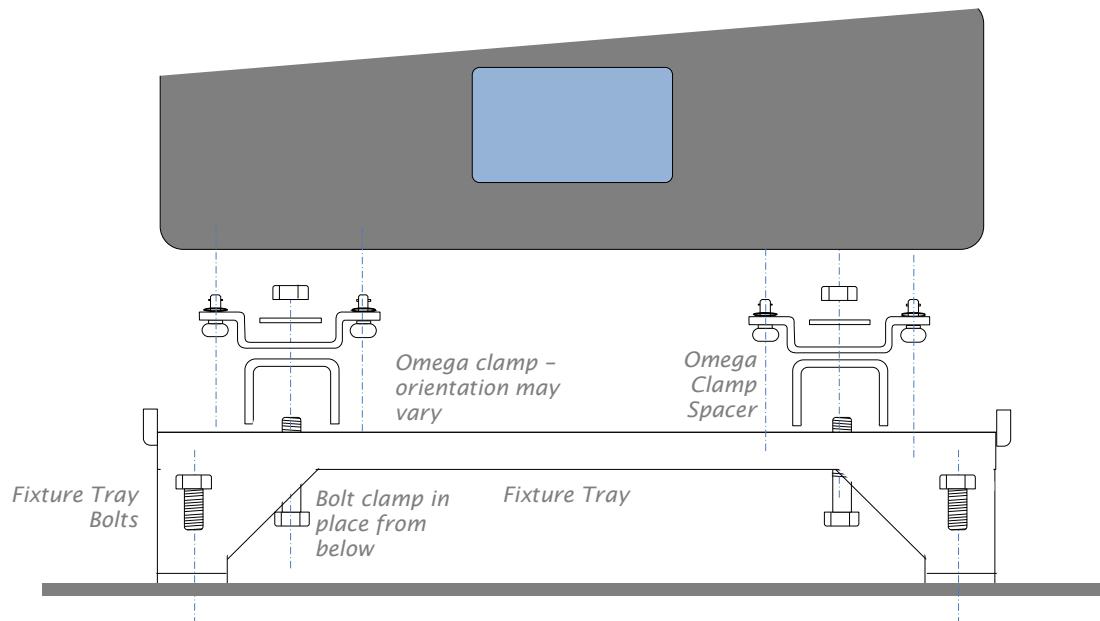
Luminaires with Omega Clamps



This applies to most luminaire types:

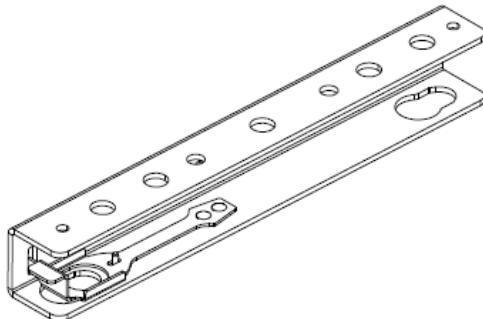
1. Remove the Fixture tray from the enclosure, as shown above.
2. Mount the Omega clamps securely onto the fixture base. Make sure that the fasteners lock positively in place.
3. Bolt the clamps to the fixture tray, using the Omega Clamp Spacers (if needed) and the bolts provided. **CHECK THAT THE FIXTURE IS CENTERED ON THE FIXTURE TRAY.**
4. Replace the fixture tray/fixture assembly in the enclosure, and bolt firmly in place.

Diagram – Mounting with Omega Clamps and Clamp Spacers



Vari*Lites and the Vari*Lite Hook Bracket

Vari*Lites are provided with a Hook Bracket in place of an Omega Clamp.



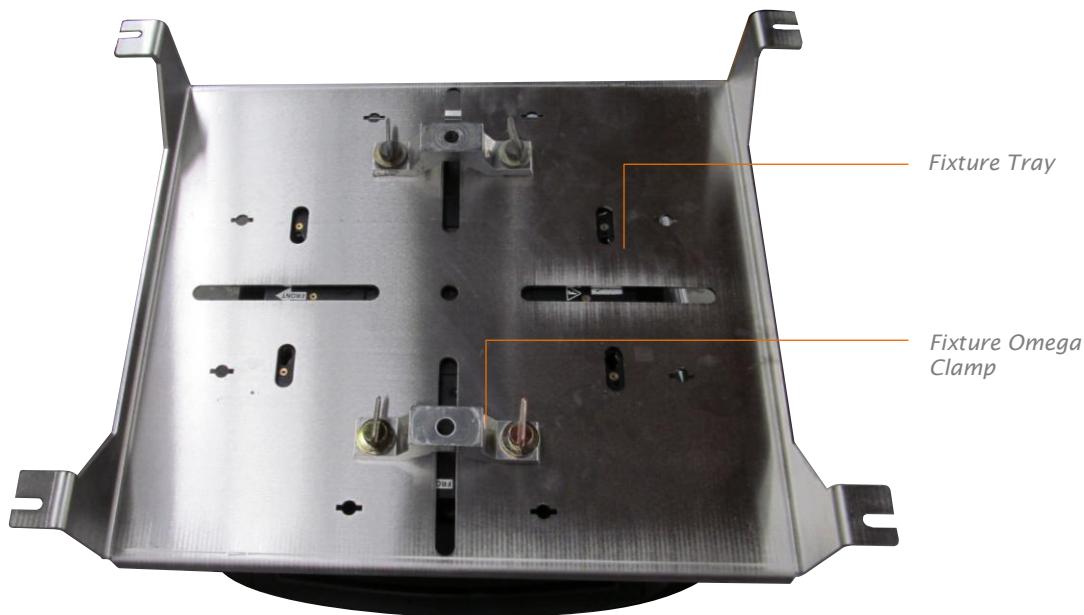
1. Attach the Hook Bracket to the VL fixture feet, following instructions provided by Vari*Lite.
5. Remove the Fixture tray from the enclosure, as shown above.
6. Bolt the Hook Brackets to the fixture tray, using the bolts provided. **CHECK THAT THE FIXTURE IS CENTERED ON THE FIXTURE TRAY.**

Replace the fixture tray/fixture assembly in the enclosure, and bolt firmly in place.

Martin MAC III and other tall Luminaires

The MACIII is too tall to use in a Tornado 2300 with Omega Clamps installed in the usual way. In this case, and in similar cases, the fixture must be secured in place with the omega clamp **BELOW** the fixture tray.

1. Remove the Fixture tray from the enclosure, as shown above.
2. Carefully place the fixture on its side on a flat surface, and identify the mounting holes in the Fixture Tray that line up with the fixture mounting locations.
3. Fit the quarter-turn fasteners through the Fixture Tray into the receptacles in the fixture base:
4. Mount the omega clamp into the quarter-turn sockets in the fixture base, through the holes provided in the fixture tray.
5. Make sure that all quarter-turn fasteners are fully rotated (clockwise) and positively locked, and that the luminaire is firmly attached to the fixture tray



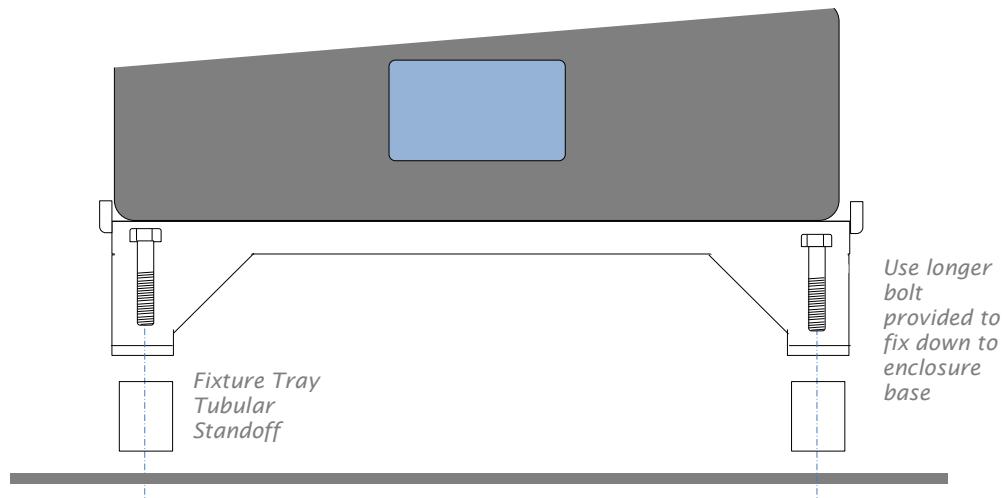
6. Replace the fixture tray/fixture assembly in the enclosure, and use the 5/16 bolts provided to secure firmly in place

Shorter Luminaires Requiring Bracket Standoffs

In order to align the center of the luminaire correctly in the Tornado enclosure, some fixtures need the Fixture tray to be raised. This is done with tubular standoffs that insert between the Fixture Tray and the enclosure Base. The installation procedure is the same as for any of the above, except that the fixture standoffs must be inserted when the Fixture Tray is remounted.

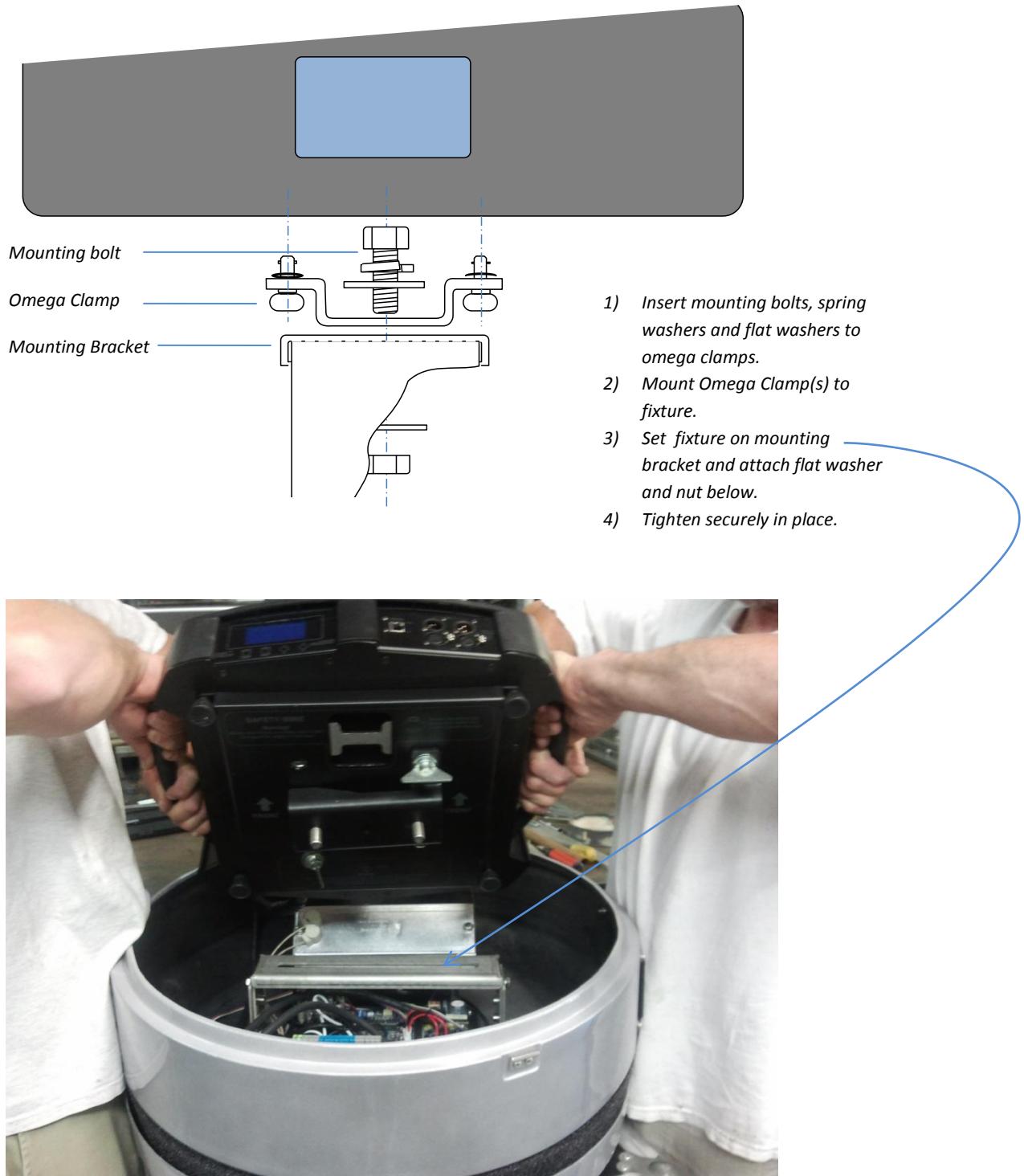
If the fixture you specified when you ordered your Tornado enclosure requires bracket standoffs, they will have been supplied. If none are supplied, your fixture does not require them.

Diagram – Fixture Tray Standoffs



Mounting the Luminaire - Tornado 2050

The Tornado 2050 is designed for most moving head luminaires up to 300W, using one or two omega clamps (supplied with the luminaire) to install.

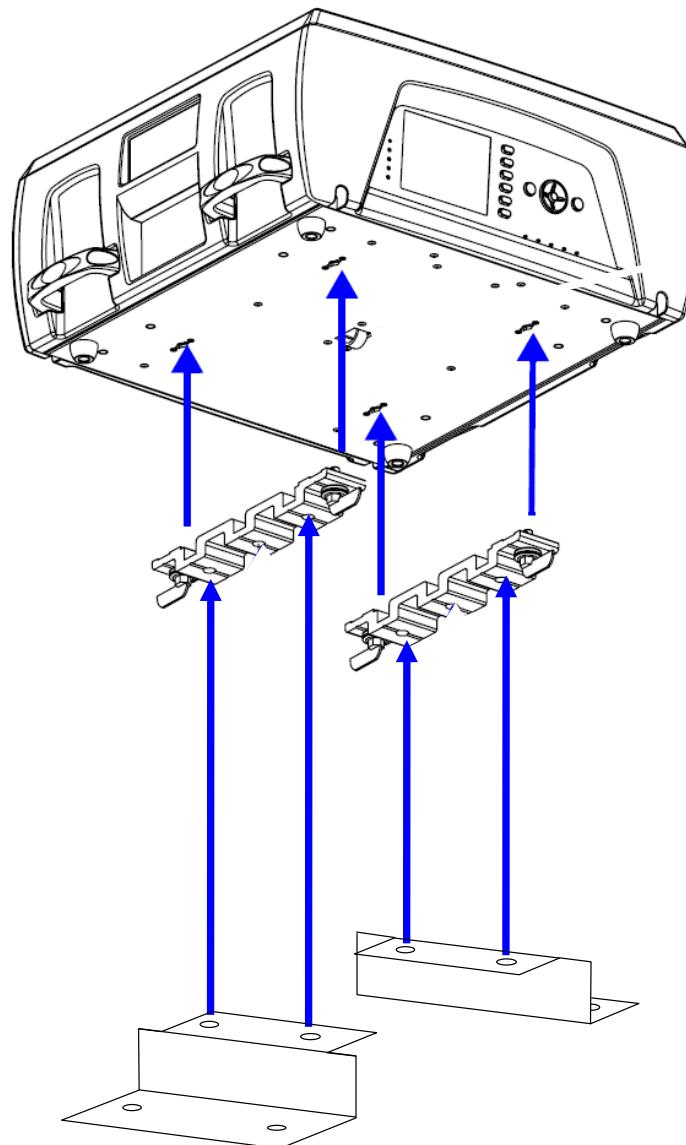


Mounting the Luminaire - Tornado 2400

The Tornado 2400 is designed to house the Barco/High End Systems Showgun, Showbeam, Showpix and DL3 luminaires, all of which have the same base.

The Tornado 2400 is supplied with two heavy-duty mounting brackets, which bolt to the extruded clamps supplied with the Showgun/Showbeam/DL3 fixture.

Mount the clamps to the enclosure brackets, then set the fixture on the clamps and secure using the quarter-turn fasteners provided.



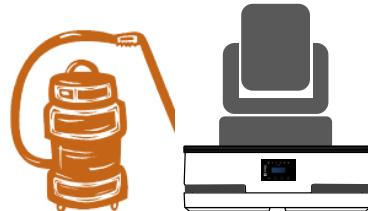
Note: DML1200 Fixture: When the Tornado 2400 is specified for the Barco DML1200, it will be supplied with a custom fixture mounting plate that bolts directly into the fixture base.

6 Closing up the Enclosure

- 1 Check all electrical connections



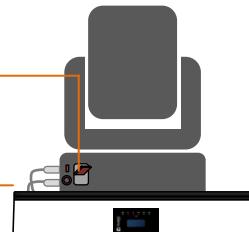
- 2 Clear the enclosure and luminaire of all dust and debris.



- 3 Check that the power switch on the luminaire is in the ON position.



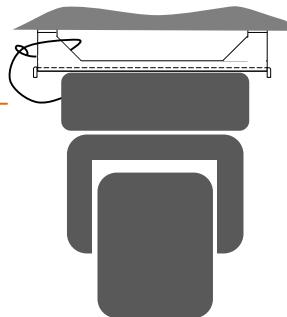
- 4 Complete DMX control connections, following luminaire manufacturer's instructions.



- 5 Test luminaire



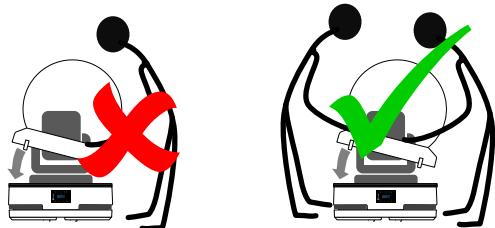
- 6 Safety cable the luminaire to the Fixture Tray leg (horizontal and vertical enclosures).



- 7 Tie down cables (to luminaire or mounting brackets) so that they will not touch heaters or fans.



- 8 Replace the globe assembly on the Tornado base. This requires two people.



Securing the Globe to the Tornado Enclosure Base

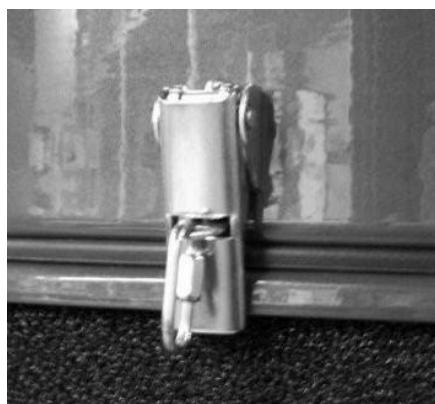
1. Using two people, lift the globe assembly in place.
2. As soon as the globe assembly is in place, secure the four latches, and insert padlocks in the locking rings, if required, for additional security.
3. *IMPORTANT: The latch tension is adjustable, and has been set in the factory to assure a secure and weathertight seal. Check to make sure the tension is maintained.*



Tension adjustment screw and locknut.

Check periodically to maintain a tight seal.

4. Security – use a carabiner or a padlock (not supplied) for additional security if desired.



Latch properly secured, with a carabiner in place.

Use a padlock for greater security if preferred.



Congratulations! Your system is now ready to check out.

7 Operation

- ① Enclosure must receive power at all times. It is an active, climate-controlled enclosure, and will not provide proper protection for the luminaire inside if it is not connected to AC power.
- ① Unless the enclosure or luminaire is undergoing routine maintenance, the globe should be in place and locked down at all times.
- ① Only authorized personnel should open the enclosure (see maintenance warnings in the next section).
- ① If the ambient temperature is high enough, the over-temperature shutdown feature may engage and temporarily cut off power to the luminaire. Once the temperature reaches acceptable levels, power will be automatically restored.
- ① **Do not** routinely operate luminaire in full sun in warm weather. Black luminaires absorb a significant amount of energy from the sun and may overheat in these conditions. The enclosure has not been designed to protect the luminaire when running in this kind of extreme condition (outside lighting is generally used at night).

8 Routine Maintenance

It is very important to perform routine maintenance on both the enclosure and the luminaire within. Failure to do so may reduce lifetime for both the enclosure and the luminaire.

Note

Maintenance schedules depend on location and environment. The times given here are general guidelines for you to use. It is up to you to judge whether maintenance should be done more often. We do advise doing these tasks no less often than mentioned here.

Safety

- ▣ Although maintenance can be performed while the enclosure is powered, it is safer to carry it out with the power disconnected with proper lockout and tag out procedures followed.
- ▣ Be aware that once the enclosure has had power applied to it, the heater will get hot and the fans will start to turn. Make sure that your hands are clear of these areas before applying power to the enclosure.
- ▣ Only authorized personnel should perform maintenance on the enclosure or luminaire
- ▣ Do not service the unit in the rain or other adverse weather conditions (snow, sleet, high winds, etc.).
- ▣ Be aware that the globe is a large object that can be awkward to handle, especially when standing on a ladder or scaffolding.

Inspection Checklist: – Every Three (3) Months

- All weep (drain) holes should be clear
- All vents should be free of debris
- Enclosure should be free of debris both inside and out
- Bolts should be tight
- All safety cable should be in good condition
- Lid seal should be in good condition, Check seal inside and out for gaps.
- Globe should not be cracked
- Fans should be moving (it will be necessary to have the power on to check this), with corresponding indicator status

Except for the last two items (concerning globe and fan), problems with any of these things can be easily remedied. Contact technical support for problems with the last two items.

Air Filters – Every Three (3) Months

The air filters all around the base should be removed and cleaned on a regular basis. To remove filters, pull them directly out of their grooves. The filters can be cleaned by running water from a hose and do not require any special solution.

To reinstall, push filter back into place between the top and bottom base covers.

Case and Globe – As Needed

The outside of the case and globe should be cleaned as needed. Outside inspection should give you a good idea of when this is necessary. The case should be cleaned with a wet cloth and mild detergent (if necessary). Do not use a direct spray from a hose to clean the case. The globe can be cleaned with any mild cleaner. It is also acceptable to treat globe with a product that keeps rain from adhering to its surface.

DO NOT USE hydrocarbon-based cleaners on the globe under any circumstances. They can severely damage the globe material.

Luminaire

Review the manufacturer's instructions for proper maintenance of your luminaire. Remember, the enclosure simply protects the luminaire and is not a substitute for regular maintenance.

9 Troubleshooting

This is a guide to the general symptoms, problems, and solutions that may occur during the lifetime of your enclosure. However, it is important to remember that problems may occur within the luminaire itself and these must also be considered.

Luminaire does not have power.

Check power switch of luminaire. (Note: the following actions should be performed by a licensed electrician) If power is on, check wiring (including metering supply voltages, enclosure must receive 200-240VAC to operate properly). If LEDs on the DEC3 control panel controller are lit, check the Lamp Relay LED. If it is on, meter power in receptacle. If no power is present at the receptacle, contact technical support.

In case of over-temperature, the power disconnection is an intended function of the enclosure and is for the protection of the luminaire, which is not meant to operate in extreme conditions. In this case, the problem will only continue until temperature drops to acceptable levels. It is possible that the air intake or exhaust has become clogged, leading to higher temperatures inside the enclosure. Make sure that these areas are clear, the filters are clean, and the fans are working properly.

Luminaire turns on and off repeatedly

Check that vent areas and airways are clear. If so, ambient temperature may be too high (see over-temperature note above) or luminaire may have internal problem.

Luminaire does not respond to DMX signal.

Make sure that luminaire has power. If so, check DMX wiring. If not, see above.

Fans are not spinning.

Fan cords may have become disconnected. Check connections between fan and cord.

Fans may be obstructed. Shut off power to enclosure and check for obstructions. Turn power back on to see if fans will start spinning. If fans do not turn and display on temperature controller is lit, contact technical support. If fans do not turn display is not lit, then enclosure is not receiving power. Turn off all power and check wiring. If the wiring is correct, contact technical support.

Excessive debris in unit.

Filter may not be fully pushed into groove. Make sure that it is in place around the whole unit.

Excessive water in enclosure.

Weep (drain) holes may be clogged. Clear them.

Latches do not latch properly.

Closure of globe may be obstructed. Check to make sure seals are clear before replacing globe.

10 Limited Warranty

INSPECTION/WARRANTY/RETURNS.

A. Customer, at its sole expense, shall inspect all Goods promptly upon receipt and accept all Goods that conform to the specifications or catalog. All claims for any alleged defect in or failure of the Goods or Seller's performance to conform to the Contract, capable of discovery upon reasonable inspection, must be set forth in a written rejection notice detailing the alleged non-conformity, and be received by Seller within thirty (30) calendar days of Customer's receipt of the Goods. Failure by Customer to notify Seller of the alleged non-conformity within thirty (30) days will be conclusive proof that the Goods have been received by Customer without defects or damage, and in the quantities specified on the bill of lading and shall constitute an irrevocable acceptance of the Goods and a waiver of any such claim in connection with the Goods.

B. Seller warrants to Customer only that the Goods will be free from defects in material and workmanship at the time of delivery and, subject to the exceptions and conditions set forth below, for the following period (the "Warranty Period"): twelve (12) months from the date of shipment by Seller. Seller may provide additional years of warranty coverage beyond 12 month, at the rate of 2.5% of the net sale price per year, up to a total of four additional years' coverage beyond the standard 12 month warranty period. Seller will remedy a defect as set forth in paragraph 7 D, below, (the "Warranty"). The Warranty is subject to each of the following exceptions and conditions:

1. Customer must promptly (and in all events within the Warranty Period) notify Seller of any alleged defect in a written notice (the "Notice") which shall set forth the quantity, catalog number, finish, original purchase order number, Seller's invoice number on which Goods were originally billed and a statement of the alleged defect, along with digital photographs showing such defects where feasible.

2. The Warranty shall not apply: (i) to any claimed defect that was capable of discovery upon reasonable inspection and deemed to be waived under paragraph A, above; (ii) to any Goods that have been subject to misuse, abnormal service or handling, or altered or modified in design or construction; (iii) to any Goods repaired or serviced by any person other than Seller's authorized service personnel or to Goods installed other than according to installation instructions, or (iv) with respect to normal wear and tear.

3. Seller makes no Warranty with respect to parts or components that are not the product of Seller, and specifically makes no warranty whatsoever for equipment housed inside enclosure products manufactured by Seller.

4. The Warranty is Seller's exclusive warranty with respect to the Goods. Seller makes no warranties, guarantees or representations, express or implied, to Customer except as set forth in this section. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR USE OR FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED AND DISCLAIMED.

C. Seller will accept the return of Goods properly rejected under paragraph A, above, or as to which Notice of an alleged breach of Warranty has been timely given and such Goods may be returned to Seller, freight prepaid, but only upon Customer's receipt of Seller's written return material authorization ("RMA") and shipping instructions. The RMA shall be void if the Goods are not received within 45 days after issuance of the RMA. No deduction or credit in respect of any rejected or returned Goods shall be taken until Customer has received Seller's further written deduction or credit/authorization following Seller's inspection to confirm nonconformity or defect. Seller will charge to Customer any and all costs incurred by Seller in connection with the handling, shipping, inspection and disposition of any returned Goods that are determined by Seller not to have been nonconforming upon Delivery or as to which the warranty hereunder is not applicable.

D. UPON ANY PROPER RETURN PURSUANT TO PARAGRAPH C, ABOVE, WHETHER IN CONNECTION WITH A REJECTION OF GOODS OR AN ALLEGED BREACH OF WARRANTY AND BASED UPON THE CONDITIONS SET FORTH IN THIS PARAGRAPH 7, SELLER AGREES THAT IT WILL, AS THE SOLE AND EXCLUSIVE REMEDY UNDER THE CONTRACT OR OTHERWISE, FOR ANY NONCONFORMITY OR BREACH OF WARRANTY, AND AT SELLER'S SOLE ELECTION: (i) REPAIR SUCH GOODS; OR (ii) REPLACE SUCH GOODS.

Tempest Product Support

Step 1: First contact your local Dealer for support. Your dealer is best placed to respond quickly to your needs.

Step 2: If your dealer is unable to answer your questions please contact

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Visit our web site for current information and specifications:

www.tempestlighting.com